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ABSTRACT

This report describes the development and evaluation of a computer-assisted, student-interactive registration program that was designed for a community school in southeastern Florida which offers courses in the curricular areas of adult basic education, GED, adult high school, business and office education, home economics, industrial education, marketing, public service, life-long learning, and education for personal improvement. The system was also designed to provide statistical information. Although the median time of 7.25 minutes for adult students to enter data into the system was significantly longer than the 5.3 minute median time for hand entry of data, the total mean registration time was reduced from 14.4 to 14.1 minutes. The shortest individual computer time was 2.35 minutes, and the longest was 25.75, with a 23.4 minute range. The reason for this broad range was a lack of keyboarding skills, especially on the part of older males in manual-skill occupations, and unemployed older females. Responses to a brief online attitude survey were overwhelmingly positive, with 97% of the students reporting that the program was easy to use, they liked it, and they thought that it should be continued. Administrative personnel were similarly positive in their evaluations. The text is supplemented by three figures and four tables, and a four-item bibliography is provided. Five appendices provide survey data and other program information.
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Ed.D. Program

Computer-Assisted Registration and
Student Statistics Reporting System

by

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Computer-Assisted Registration and
Student Statistics Reporting System

by

G. Robert Wilson

Cohort 4

A Practicum II Report Presented to the Ed. D. Program
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA UNIVERSITY

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ABSTRACT

Computer-Assisted Registration and Student Statistics Reporting System.

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Descriptors: Community Schools/Computer-Assisted Registration/Student-Computer Interaction/Administrative Programs for the IBM PC/BASIC Administrative Programs

This project addressed the problem of manual registration procedures at a Community School in Southeastern Florida. Adult students took an average of 14.4 minutes to obtain a registration form, fill it out, have it checked and pay their fees. Registrars would then compute and compile this data in a highly labor-intensive manual process.

The central goal of this project was to reduce registration time and effort for both students and administrative personnel through the development and implementation of a computer-assisted, student-interactive registration program. The BASIC program, running on several of the school's IBM PCs, was designed to be easy to use by students while collecting appropriate course, personal and statistical data that was saved on floppy disk and printed on individual registration forms. The program proved to run error-free and was crash-proof.

While the median time of 7.25 minutes to enter data via the keyboard was significantly longer than the 5.3 minute median time for entry by hand (Median Test: $X=8.44$, $df=1$, $p < .01$), the total mean registration time was reduced from 14.4 minutes to 14.1. This time reduction was not tested for significance. The shortest computer time was 2.35 minutes and the longest was 25.75, with a 23.4 minute range. The reason for this broad range was a lack of keyboarding skills, mostly by older males in manual-skill occupations and unemployed older females.

The responses to a brief on-line attitude survey were overwhelmingly positive with 97 percent of the students reporting that the program was easy to use, that they liked it and thought that it should be continued. Administrative personnel were similarly positive in their evaluations.

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Chapter I: Introduction

Description of the Community

The setting for this practicum was a Community School in Southeastern Florida, where an annual total of over 4000 Adult Education students usually register in person for courses during a week-long registration period that occurs five times during the academic year. The student population age ranges from less than 5 to over 60. The socio-economic classes represented are upper-middle, lower-middle and upper-lower. Courses offered are in ten curricular areas: Adult Basic Education (ESOL), GED, Adult High School, Business and Office Education, Home Economics, Industrial Education, Marketing, Public Service, Life-Long Learning and Education for Personal Improvement.

Writer's Work Setting and Role

The writer is a part-time instructor in this Community School setting. After observing the registration process and discussing the need for improvement in both this process and the student statistics reporting procedures with administrative personnel, the writer was given the opportunity to devise a computerized system for registration and student data-collection that forms the basis for required reporting to the State Education Department at the end of the academic year.

Chapter II: Study of the Problem

Problem Description

Since the Adult Education courses are offered in the evening, registering for these courses occurs in the afternoon/evening, with the heaviest traffic from 5:30 to 8:00 PM. The process of manually registering (in longhand) takes several minutes per student, and there is usually a line including several people waiting to obtain the right form and instructions about filling it out. After filling out the form, the student waits in line to present the form to the registrar, then waits while the registrar looks over the form for omissions or errors. Since many students do not fill in the form accurately or completely, the registrar has to ask many of the same questions to several students, filling in the items for them on the registration form (a legal document). Thus, the entire process for just one student can consume up to a half hour, though it is usually less. This writer has observed that most of this time is spent waiting in line.

In addition to the problem of students waiting, the requirement of year-end reporting of student statistics to the State Education Department is also problematic. These statistical data currently have to be computed and compiled manually, consuming scores of man-hours by administrative staff.

The central problem in this Community School's registering and reporting processes involved the continued use of manual procedures to collect, compile and report student data. Automation of these procedures as a result of this practicum has reduced errors, repetition, student waiting time and report compilation time.

Problem Documentation

Interviews with administrative staff show that, currently, student data required in the year-end report are obtained by examining each of the over 4000 registration forms, copying the data from them manually, or even having to compute by hand some of the category numerical data that is required. This process consumes scores of man-hours yearly of administrative staff time.

Causative Analysis

A major cause of students waiting in line so long was the lack of additional assistant registrars so that more students could be registered in a shorter time. The administration reports that budgetary constraints have precluded the hiring of additional personnel.

One of the most time-consuming details in the year-end report involved the calculation and compilation of age-group statistics. While required reporting demands the classification of each student into one of eight age groups, the registration form asks only for date of birth. Thus,

a current age for each student had to be computed manually, then recorded manually as being in one of the eight age groups. Other statistical data had similar, yet less extensive problems that also needed a better means of information processing. These included student information regarding ethnic background, sex, resident status, educational background and employment. Administrative data including course fees, class sizes and course numbers also were in need of more efficient processing.

Though the Community Schools in this county have revised their registration forms for almost every registration period, this solution strategy has failed to make the registering/reporting processes more efficient and effective. While the three vocational centers in the county have implemented a computerized registration process, students still have to obtain a form, fill it out, hand it in and have it checked before it goes to a data-entry clerk to be keyed into the computer. Not only is little time saved, but the data are entered twice, once on a hardcopy form by the student, and again via the keyboard by the data-entry clerk.

The Related Literature

While there are no direct references in the literature to the use of computer technology that specifically relate to student-interactive computerized registration, similar use of the computer is predicted by Cetron (1985, p. 10), Ofiesh (1984) and Wilson (1987).

T.H.E. Journal's 1986-1987 and 1987-1988 Source Guide list two commercially-produced administrative software packages, Registrar and Campus, that contain modules for input and retrieval of student information. However, these packages are for administrative use only, and do not allow student interaction with the computer.

It is likely that a stand-alone, student-interactive computerized registration package is too minor a product for the development firms to produce and market profitably, yet too time-consuming for in-house development at any given educational institution.

Chapter III: Anticipated Outcomes and Evaluation Instruments

Statement of General Goals

The goal of this project was two-fold: to (1) reduce the length of time it takes a student to register, thus increasing registration throughput, and (2) significantly reduce the amount of time administrative personnel spend in computing and compiling student statistics for the report at the end of the academic year. An ancillary goal was to familiarize adult students with computer use, and increase their computer literacy by the experience of directly interfacing with the machine. While it is likely that any given student registering by computer will take longer than if the form had been written out by hand (because of the greater familiarity with the medium of hand-written communication), the availability of several (10-12)

computers may decrease the waiting time such that the total time spent in the computerized registering process may be less than the total time taken in the comparable manual form of the process. Pilot testing scheduled for November 1987 excluded registration for Adult Basic Education (ESOL), GED and Adult High School.

Behavioral Expectations

The major criterion of successful goal attainment was the effectiveness of the computer-assisted method in accurately registering students in the courses offered to them and accurately collecting, computing and printing the required data for student statistics reporting requirements.

A random sample of the time it took a student to register manually was taken using a stop watch. The amount of elapsed time between beginning the computer program and entering the last keystroke was measured in minutes and seconds by the application program using the internal clock of the IBM-PC computer. Unexpected events that had the highest probability of occurrence were unanticipated design malfunctions in the program during formative evaluation procedures under both simulated and real conditions.

Evaluation Instruments

Since this was a developmental practicum and not an inferential statistical study, only minor emphasis was

placed on statistical analysis of the data, though it may be a focal point in a future study. Largely, the criterion of success was that the program executes correctly and collects, computes, compiles and prints the required student data accurately and efficiently while printing out the form.

The mean recorded times of the two registration groups (manual vs. computer) were compared using the Median Test (Chi Square) since the students were self-selected (non-randomly). Again, however, this was only a minor focus in the project.

The data on report compute/compile time was not subjected to statistical analysis because the manual process takes many hours of administrative time, and the automated process takes minutes. Statistical analysis was unnecessary, for clear superiority of the automated process was evident.

This was a developmental practicum, so statistical significance in elapsed time was not a central issue, but was reported as a minor, ancillary event.

Chapter IV: Solution Strategy

Discussion and Evaluation of Solutions

Perhaps the most obvious solution to the problems of student registration was to hold the event in a large room with 10-12 assistant registrars employed to check form accuracy and completeness, and collect fees. Students could be given printed instructions on how to fill out the form,

and the forms could be made available in a stack by the entry door with signs telling students to take a form, read the instructions and complete it correctly. Then they could take the completed form to one of the dozen or so assistant registrars and pay their fees and be done with registering in a few minutes.

Unfortunately, regular high school does not let out until 4:30 PM and detention is held in the large cafeteria until 5:30. Adult Education registration begins at 3:00 PM, so there are no appropriate rooms available. But more important are the budgetary constraints that preclude the hiring of more part-time personnel to assist in this event. Printed instructions have been tried, and many students (especially older females and vocational-course males) leave out much of the required data on the form.

Another solution strategy was to adopt the computerized registration process of the local vocational centers that are part of the same county school system. However, this would likely result in an even slower total process, for students fill in forms that are then checked for completeness and accuracy, then given to a data-entry clerk who types the data into the computer. This can easily result in more data handling, thus increasing the probability of errors in the data. A larger central computer would likely have to be purchased as well.

Description of Selected Solution

The solution strategy of choice was the development and implementation of an interactive, computerized registration system where a student interfaced directly with one of many available IBM-PC computers in registering for their courses. With the computer running an application program created by this writer, all appropriate student data were collected through this interface, and a hardcopy of the current quadruplicate-copy form was printed out for each student to present to the registrar along with the computer-calculated fee payment. The program required that the student make an entry for all required items that are included on the pre-printed form. All necessary student data were also saved on each program/data disk. Class sizes were automatically updated with each registration, as were student statistical data. At the end of the academic year, these data will be readily available to the administration.

The applications program that accomplished the goals of this practicum was written in Advanced BASIC for use on the school's monochrome IBM-PCs. Okidata 92 printers were connected to each PC for registration form printout.

The main program that the students used to register for courses was simple to use for even the person with no computer experience.

The development of this computerized registration system has drawn heavily on the Nova University CED areas of Courseware, for good screen design was critical to

student success in registering; from Systems Analysis/DBMS because record design was also important in the overall success of the development effort; from Curriculum, the formative evaluation process; from Research, the design of the study and from Practicum I, the motivation to do something bigger and better.

Chapter V: Results, Implications, and Recommendations

Results

The main objective of this Practicum was two-fold: to reduce the amount of time taken for a student to register for a course and to reduce the amount of administrative time and effort required in compiling student statistical data at the end of the academic year. An ancillary goal was to expose adult students to computer interaction, thereby increasing their computer literacy and generating a more positive attitude toward computer usage. The main criterion of successful attainment of the objective was that the computer-assisted registration program would execute error-free and gather student registration data correctly and efficiently, while generating appropriate printed output on the registration form.

These objectives were successfully met. However, the computer-assisted registration process consumed about the same amount of time as the manual process. In the manual registration process, students waited for an average of 4.5 minutes to obtain a form and verbal instructions, took 5.6

minutes to fill out the form, then waited 4.4 minutes while the form was checked for accuracy and the fee payment was processed. This yielded a total manual registration time of 14.4 minutes. For the computer-assisted process, wait time was usually zero, with an average computer interaction time of 8.4 minutes, but the wait to pay fees was longer at 5.7 minutes, yielding a total of 14.1 minutes. The total time difference between the two registration processes was less than one-half minute. Intuitively, this net difference does not appear to be a significant time savings (see Table 1).

However, the difference in data entry time between the two groups was significant (Median Test, $X = 8.4375$, $df = 1$, $p < .01$, two-tailed).

Table 1

Mean and Median Registration Times In Minutes

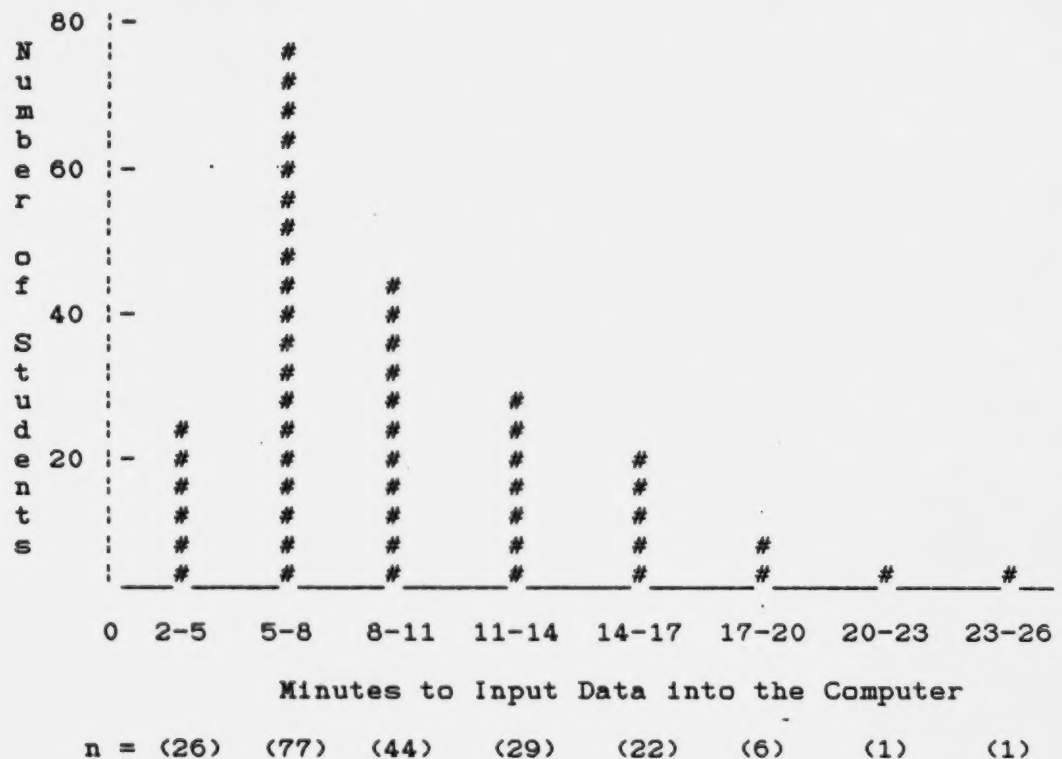
	Computer-Assisted	Manual
Wait time	0.0	4.5
Mean data entry	8.4	5.6
Median data entry	7.25	5.65
Pay fees	5.7	4.4
Total time	14.1	14.4
Time range	16.7	4.4

Although manually-registering students were sampled randomly and computer-registering students were sampled

using a systematic random method, parametric statistical techniques could not be used on the data because the students were not assigned to groups randomly, sample variances were grossly unequal and the registration times were not normally distributed. Figure 1 shows the positively-skewed nature of the data for the total number of students registering by computer.

Figure 1 Registration Intervals for All Students

(N = 206)



The calculated median for all computer students equaled 7.25 and is reflected by the computer-calculated distribution in Figure 1.

The median data entry time for all males is greater than that for all females, so this difference was tested for significance, again using the Median test for the same reasons as with the samples. Figures 2 and 3 give the distribution of these data respectively. It can be seen in these figures that the data here are not normally distributed, and that the data on male data entry times approaches that of a bimodal distribution. With medians of 9.92 and 7.43 minutes for males and females respectively, significance was found between these differences ($X = 7.061$, $df = 1$, $p. < .01$).

Figure 2 Registration Intervals for Male Students

(N = 69)

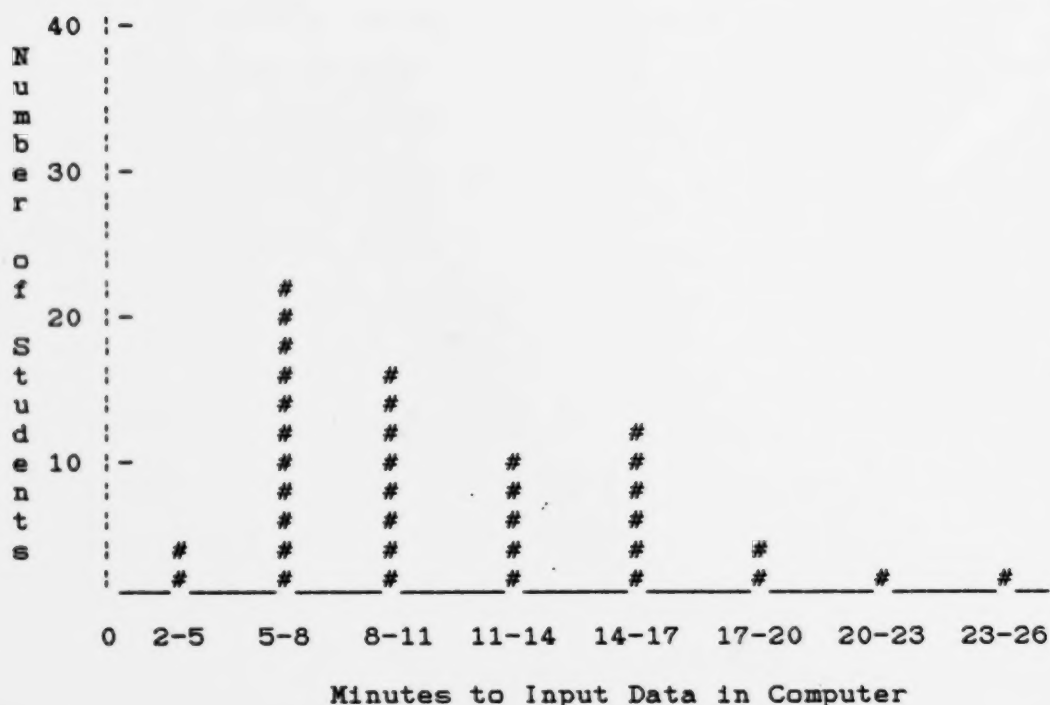
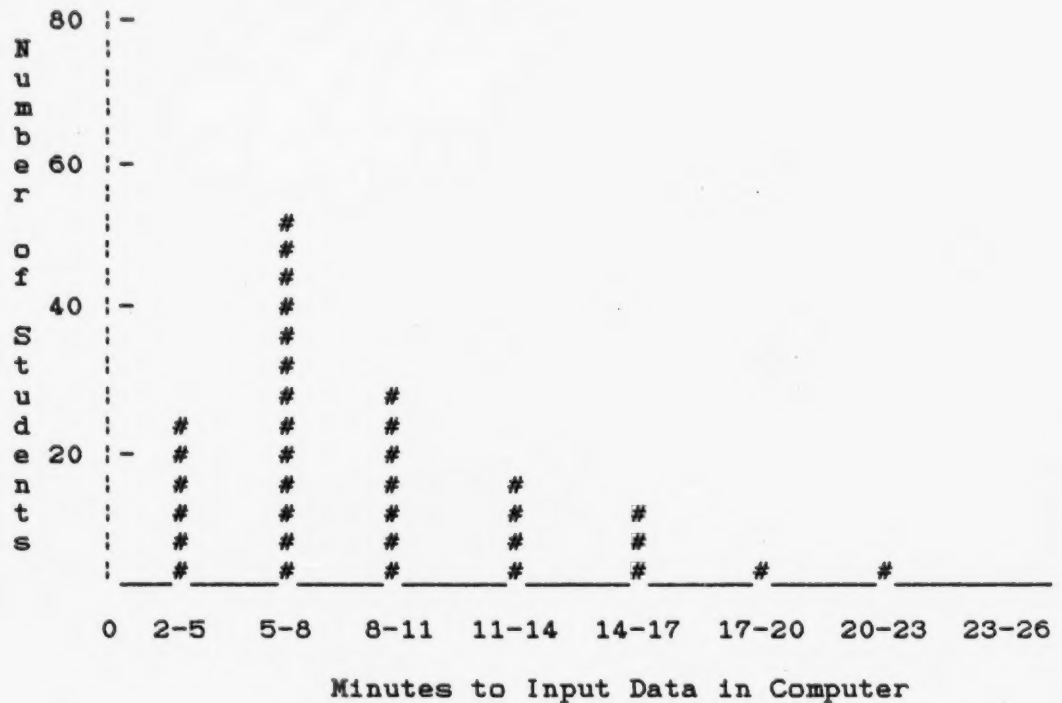


Figure 3 Registration Intervals for Female Students

(N = 137)



Implications

As shown in Table 2, males generally took longer than females to input their data, and this difference was found to be significant. Those who were unemployed also took longer, but this difference was found not to be significant, due to the similarity in cell frequencies on the Median test. As expected, data input time varied inversely with reported computer experience and reported educational level. It is interesting, however, that reported college graduates took slightly longer than high school graduates, but this

difference was also found to be not significant.

Table 3 is an image of the students statistics table that is generated by the program for administrative use. It shows that most students registering were non-hispanic whites between the ages of 23 and 59, with females outnumbering males by over two to one.

The brief on-line attitude survey (see Appendix C) yielded definite positive responses as shown in Table 4.

Table 2

Median Subgroup Computer Registration Times

Group	n	Median Time
Males	69	10.50
Females	137	8.35
Employed students	136	8.36
Unemployed students	70	9.80
Not HS graduate	25	11.40
High School graduate	110	8.56
College graduate	71	8.94
No computer experience	106	10.37
Some computer experience	74	7.96
Much computer experience	26	6.95

Table 3

Statistical Data by Age Group, Race and Sex

AGE		WHITE		BLACK				PACIFIC		INDIAN/	
		NON-HISP		NON-HISP		HISPANIC		ISLANDER		ALASKAN	
		M	F	M	F	M	F	M	F	M	F
1	<5	0	0	0	0	0	0	0	0	0	0
2	6-12	2	0	0	0	0	0	0	0	0	0
3	13-16	0	2	0	0	2	2	0	0	0	0
4	17-22	8	11	0	1	1	3	0	0	0	0
5	23-34	13	42	1	0	1	4	0	0	0	0
6	35-44	12	26	3	0	1	7	0	0	0	0
7	45-59	14	24	0	0	0	1	1	1	0	0
8	60+	9	12	0	0	1	1	0	0	0	0

Table 4

Responses to Attitude Survey About Computer Registration

	Easy. to use?	Like it?	Use it more?	Liked most about it ...	Liked least about it ...
Yes	202	199	201	Highly positive, with	
No	4	7	5	few negative remarks.	
Note: see Appendix C & D					

Discussion

Table 1 shows a much wider range of data entry times for students who registered by computer compared to those who registered manually. The slowest computer student in the sample took 19.7 minutes to enter data on the keyboard, and the fastest took 3.0 minutes. Of the 206 students who registered by computer, the slowest took 25.75 minutes and the fastest took 2.35 minutes. Manually, the slowest took 8.2 minutes and the fastest, 3.8 minutes. It is suggested that the greater familiarity with filling out forms by hand accounts for the significantly faster manual time and less amount of variability.

Conversely, the high degree of unfamiliarity with computer data entry by most students ($N = 180$) resulted in significantly greater time to enter their data. The writer observed many people who did not have keyboarding skills, demonstrated by their use of one finger to type. These students took much longer to register than those who could type well. Many of the slowest were older males whose occupation could be classed as "blue collar", or mostly involving physical labor, and they didn't type well.

Perusal of the data in Appendix D shows that many of the unemployed students took a greater amount of time to enter data. Those whose data entry times were the shortest were generally females whose occupation involved clerical work. With the wide-spread use of personal computers in offices, these students likely had more experience with data entry. However, a few of these students typed too

fast, making errors, and consequently had to re-enter their data, but with few complaints.

The data in Appendix D includes a listing of the positive responses given by all the computer-using students. The vast majority of "negative" responses to the attitude scale were "none", "nothing" and similar words to describe what they liked least about the program. Thus it can safely be stated that the student response to the computer-assisted registration program was overwhelmingly positive.

Recommendations

Recommendations include the use of the program on a networked system to make compilation of data easier. However, networked PC's are currently unavailable in most school systems, and will likely remain so for at least another five years. Since many of the available school computers are Apple computers, perhaps the program should be adapted for use on those systems.

Dissemination

The program is available to any Community School that is interested in computerizing their registration process. However, there is rumor at the higher administrative levels in the county school system that a centralized process of registering Community School students is being considered.

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**COMPUTER-ASSISTED
REGISTRATION**

NOVA-DAVIE COMMUNITY SCHOOL

PROGRAM DISK # 1

Appendix B
Registration Time for Samples

	Computer Process	Manual Process
	(in minutes)	
	5.9	4.8
	7.3	5.6
	11.6	6.1
	3.5	8.2
	10.5	4.8
	8.3	4.1
	19.7	5.2
	16.1	4.9
	7.2	7.2
	5.2	3.7
	3.9	5.4
	9.8	6.3
	10.6	4.7
	7.3	4.9
	5.0	5.7
	8.4	5.6
	5.0	6.5
	5.6	4.8
	3.0	7.6
	5.5	6.4
	16.9	4.7
	-----	-----
Total time	167.9	111.6
Mean time	8.4	5.6
Median time	7.25	5.30
Combined median	5.65	5.65

Appendix C

On-line Attitude Survey

(screen width = 80 characters)

Though you told me that you've had [NO, LITTLE, SOME, MUCH] computer experience, you've done very well, [Firstname]. It took you ## minutes and ## seconds to register.

In a few moments, your registration form will be printed out for you. But first, I'd like to know what you think of this method of registration.

Is the computer system easy to operate? (Y/N then ENTER) Y

Do you like registering for a course this way? (Y/N then ENTER) Y

Do you think this way of registering should be continued? (Y/N then ENTER) Y

Type 1 or 2 words describing what you liked MOST about this registration experience, then press ENTER. POSITIVE RESPONSE

Type 1 or 2 words describing what you liked LEAST about this registration experience, then press ENTER. NEGATIVE RESPONSE

Thank you for your participation, [Firstname].

Press the ENTER key to print your registration form.

Appendix D

Student Listing With Time, Sex, Age, Employment Status, Occupation, Positive Comments

8.05	F	55	N	2		UNIQUE
15.07	M	49	Y	1	SELF EMPLOYED	VERY GOOD
7.85	F	41	Y	3	SUBSTITUTE TEACHER F	EASY
7.62	F	38	N	1		FAST
12.32	M	24	Y	1	CONSTRUCTION FO	GREAT
12.35	M	63	Y	1	RECREATION DIRECTOR	BECAME FAMILIA
5.83	F	33	Y	1	NEWSPAPER PRODU	FUN
14.88	M	62	Y	1	REAL STATE	PRECISION
4.27	F	47	Y	1	SECRETARY	GREAT
12.55	F	40	N	2		DIFFERENT
5.97	F	21	Y	2	ACCOUNTING SUPERVISE	LEARNING EXPER
5.97	F	21	Y	2	ACCOUNTING SUPERVISE	LEARNING EXPER
5.08	M	30	Y	2	ELE. TECH	NO WAITING
3.00	F	34	Y	2	EXECUTIVE SBCY	NO WAITING
10.33	F	69	N	1		MOST ACCURATE
5.65	F	31	Y	2	PAYROLL BOOKKEEPER	VERY NICE
9.57	F	29	Y	2		INTERESTIN
4.28	F	49	Y	3	TRAVEL AGENT	MUCH FUN
7.43	F	18	Y	1	BABYSITTER	EASY
10.73	M	17	N	3		Easy-Informati
10.73	M	17	N	3		Easy-Informati
6.05	M	12	N	2		SUPER-FANTASTI
6.05	M	12	N	2		SUPER-FANTASTI
5.52	F	39	N	2		FAST AND E
3.20	F	62	Y	2	CLERK	GREAT
12.22	F	62	N	1		FAST
12.12	M	25	Y	1	WATER TREATMENT PLAN	FUN EFFICIENT
5.48	F	32	Y	3	ULTRASOUND SUPERVISO	EASY
2.82	F	14	N	1		I DONT CAR
7.27	F	34	N	2		IT WAS FUN
6.35	F	44	Y	1	SECRETARY	NO HASSLE
8.43	F	40	Y	2		SIMPLE
25.75	M	39	Y	1	AUDITOR	SIMPLE
15.98	M	38	Y	1	PLUMBER	IT WAS FUN EXP
5.48	F	38	Y	2	FISCAL ANALYST	COMPUTER HANDS
5.02	F	24	Y	1		FUN
17.08	M	65	N	1		GOOD EXPERIENC
7.18	F	37	Y	2	FIREFIGHTER	OK
11.88	F	57	N	1		QUICKER
5.63	M	21	Y	2	PLANT OPERATOR 1	WONDERFUL
3.75	F	38	Y	2	SECRETARY	EASY AND FAST
8.92	M	46	Y	1	SALES MANAGER	QUICK
6.23	F	49	N	1		NEAT
3.30	F	32	Y	2	RECEPTIONIST	IT WAS AN
11.28	F	37	N	1		FAST AND FUN
13.55	F	14	N	1		FAST AND FUN
11.65	F	25	Y	1	POLICE OFFICER	IT WAS EAS
11.70	M	64	N	2		VERY INTERESTI

3.37	F	20	Y	2	CLERK TYPIST	EASY
6.17	F	48	Y	2	ADMINISTRATIVE ASSIS	EASY
6.32	F	23	Y	1	OFFICE MANAGER	FUN
15.82	M	38	Y	1	MAINT-WORK	GREAT
14.63	F	72	N	3		EASY
8.28	F	43	Y	2	BOOKKEEPER	FAST ACCURATE
8.28	F	43	Y	2	BOOKKEEPER	FAST ACCURATE
16.22	F	49	Y	1		MORE MOTIV
11.23	F	30	Y	1	SECRETARY	VERY EASY
4.00	F	55	Y	1	INSURANCE UNDERWRITE	FUN
7.33	F	26	N	2		FUN INTERESTIN
10.32	F	45	N	1		EASY FUN
10.32	F	45	N	1		EASY FUN
5.03	F	39	N	1		ENYERESTING
2.88	F	20	Y	3	RECEPTIONIST	WONDERFUL
7.87	M	57	N	1		FAST
14.47	F	34	N	1		FAST
11.23	F	22	Y	1	PARALEGAL	INTERESTING
10.08	M	40	N	2		ITS FUN
10.68	M	51	Y	2	TAX COLLECTOR	FUNNY
8.28	F	40	Y	1	TEACHER HIGH SCHOOL	FUN CHALLENGE
11.58	F	39	Y	2	SERVICE TECHNICIAN	YOUR SELF
5.87	M	25	Y	2		EXCELLENT
9.43	M	35	Y	2	ELECTRICIAN	IT TRY'S TO GET
15.82	M	36	Y	1	PRINTER	EASY
3.47	M	52	Y	1	KITCHEN-BATH DESIGNE	CONVENIENT
7.20	F	19	Y	1	VETERINARIAN TECHNIC	EASY AND EFPEC
6.27	F	37	Y	3		DO NOT HAV
6.35	F	45	Y	2	FISCAL OFFICER	LOTS FUN
6.83	F	45	N	1		FAST
13.42	F	39	N	1		FUN
7.15	F	32	Y	2	MEDICAL LAB. TECHNOL	EASY & FAST
7.55	F	27	Y	2	BOOKKEEPER	FUN
3.63	F	58	N	2		EASY
10.47	F	29	N	1		LEARNING I
10.47	F	29	N	1		LEARNING I
9.27	F	24	Y	1	SALES REPRESENTATIVE	EASY AND FAST
6.65	F	29	Y	3	MARKETING DIRECTOR	PERSONAL
15.02	F	41	Y	1	DRY CLEANER	IT IS EASY
8.82	F	27	N	1		GIVES YOU A BA
5.33	F	25	Y	2	ENGINEER	EASY AND FUN
6.75	F	46	Y	3	REAL ESTATE SALES	FAST NEAT
9.92	M	64	N	1		DIFFERENT
5.78	M	64	N	1		DIFFERENT
5.98	F	20	Y	2	STUDENT/WAITRESS	EASY
5.75	F	30	Y	2	BOOKKEEPER	FAST
8.67	M	50	Y	2	I AM CURRENTLY EMPLO	JUST GREAT///
11.60	M	45	Y	2	POLICE SERGEANT	EASY
11.60	M	45	Y	2	POLICE SERGEANT	EASY
9.10	M	25	N	1		VERY INTERESTI
10.98	M	17	N	2		NO PERSONNAL E
5.98	F	46	Y	1	MORTGAGE BROKER	ACCURACY
7.97	M	32	Y	1	SECURITY OFFICER	SIMPLE
7.62	M	46	Y	1	SALESMAN	EASY
15.10	M	26	Y	1	HAIRDRESSER	IT PRINTS CLEA
6.10	M	28	Y	1	CONSTRUCTION	CONCISE
10.23	F	39	Y	2	ACCTS PAYABLE	GOOD

3.60	F	42	Y	1	LEGAL SECRETARY	QUICK
9.78	F	41	Y	2	DISPATCHER	FUN
6.50	M	43	Y	2	SUPERVISOR	SLOW
16.90	F	29	N	1		EASY
10.40	F	42	Y	1	WASTE WATER TREATMEN	FUN FAST
11.32	M	35	Y	1	MOSON	DIFFERENT
4.40	F	28	Y	2	ADMINISTRATIVE ASSIS	EXCELLENT
7.95	F	69	N	1		SERVICE
7.92	M	41	Y	1	WASTEWATER TRAI	fun
7.48	M	65	N	1		FUN
11.83	F	61	N	1		FUN
11.35	M	66	Y	1	EXEC. RET.	SIMPLE EXPLICI
6.93	f	35	N	1		EASU
5.77	F	31	Y	3	FILE CLERK	IT IS FAST AND
6.67	F	51	Y	1	BOOKKEEPER	FAST
13.85	F	36	N	1		EXTRA THINKING
3.88	F	26	Y	1	TELEPHONE SERVI	VERY GOOD
6.68	M	40	Y	1		NMICE
8.72	M	21	Y	1		ITS WAY CO
12.57	F	27	Y	2	ADMINISTRATIVE ASSIS	LEARNING EXPER
12.57	F	27	Y	2	ADMINISTRATIVE ASSIS	LEARNING EXPER
5.92	F	38	Y	2	REVENUE OFFICER	SATISFYING
14.48	M	46	Y	2	FINANCIAL SERVICES	UNIQUE
3.65	F	39	Y	1	WHOLESALE BROKER	FAST
8.37	F	21	Y	1	WATER AND WASTE WATE	QUICK
9.90	F	33	N	1		LEARNING E
5.22	F	17	N	2		EASY
7.80	F	31	Y	2	SALES MERCHANDIZER	SIMPLE
12.20	F	67	N	1		INTERESTING
9.28	F	20	Y	1	TELLER	VERY GOOD
4.77	F	25	Y	2	MEDICAL STAFF LIAISO	FUN
5.63	F	30	N	1		LEARNING EXPER
6.95	F	43	Y	2	RESERVATIONIST	DIFFERENT
8.53	M	21	Y	2		FAST EFFIC
6.00	F	45	Y	2	PROFESSIONAL CLOWN	EASE SPEED
10.02	F	35	Y	1	MARKETING EXCUTIVE	MOST IMPRESSIV
7.07	F	56	Y	2	EXECUTIVE SECY.	IT WAS FUN
6.78	F	34	Y	2	TEACHER	TYPED ANSWERS
13.98	M	65	N	1		SIMPLE
9.65	F	46	Y	1	REVENUE OFFICER	FUN SMART
17.08	M	42	Y	1	DISTRIBUTION MGR	FANTASTIC
21.23	F	40	Y	2	BANK HEADTELLER	COPUTOR USE
11.32	F	54	Y	1	BOOKKEEPER	INTERESTIN
3.42	M	27	Y	1	HOTEL CLEANING	ASDF
5.00	M	30	Y	3	ELECTRICIAN	EASE; QUICKNESS
13.72	F	48	Y	2	OPERATOR	EFFICIENT
8.62	F	43	N	1		LEARNING EXPER
14.20	F	68	N	1		FAST AND ACCUR
8.52	F	25	Y	3	SALES ADMINISTRATIVE	FAST AND EFFIC
8.52	F	25	Y	3	SALES ADMINISTRATIVE	FAST AND EFFIC
10.60	M	28	Y	2	ELECTRICIAN	PERSONALIZED
7.83	M	67	N	1		SIMPLE AND PR
5.12	F	65	N	2		FAST
15.70	M	42	Y	1	ELECTRICIAN	PRAISE THE LOR
7.13	f	21	Y	1	Sales	Easy and Fast
7.18	M	48	Y	3	CONTROLLER	EASY FAST
14.20	F	74	N	1		EXCITING

9.37	F	30	Y	1	HAIRDRESSER	NO
6.38	F	33	Y	1	HORTICULTURIST	FIRST TIME AT
3.20	F	30	Y	1	SECRETARY	DIFFERENT UNIQ
8.58	F	34	Y	2	ACCOUNT EXECUTI	FUN
6.85	M	31	Y	2	SCHOOL DIRECTOR/FIN.	QUICK AND SIMP
6.50	F	39	N	3		FAST AND E
8.32	F	36	Y	3	COMPUTERS	REALLY EASY
4.43	F	25	Y	3	LOAN PROCESSOR	EASY
16.95	M	32	Y	1	ELECTRICAN	IT WAS FUN
3.52	F	31	N	1		EASY
16.03	f	34	y	1	SELF EMPLOYED	NICE
7.30	F	31	Y	1	MEDICAL TECHNOLOGIST	FUN EASY
8.68	M	17	N	2		EASY
6.58	F	45	Y	2	TRAVEL AGENT	NO LINE
9.73	M	35	Y	2	N/A	FUN
2.35	M	35	N	2		QUICK
4.15	F	27	Y	3		IT WAS AN
14.32	M	26	Y	1	ELEC	NOTHING
7.92	F	31	Y	2	SECRETARY	VERY FAST AND
5.40	M	42	Y	2	MANAGER FOR FPL	VERY FAST
19.60	M	46	Y	1	A/C TEC	HANDS ON
19.85	M	21	Y	2	AC/R	SELF EXPLA
11.33	M	42	Y	2	CIVIL ENGINEER	PRIVATE
11.55	F	65	N	1		IT IS FUN
16.08	F	64	N	1		FASCINATIN
16.08	F	64	N	1		FASCINATIN
8.40	F	42	Y	2		INTERESTIN
7.47	F	57	N	3		IT IS IDIO
7.47	F	57	N	3		IT IS IDIO
7.47	M	58	N	3		EASY
7.47	M	58	N	3		EASY
7.47	M	58	N	3		EASY
19.68	F	19	N	1		EASY
19.68	F	19	N	1		EASY
6.43	F	48	Y	2	BOOKKEEPER	QUICK
4.83	F	30	Y	3	insurance agent	quick and
7.93	M	32	Y	1	CENTRAL WAREHOUSE BR	VERY SIMPLE
3.90	F	22	Y	3	BOOKKEEPER	INTERESTING
10.48	M	22	Y	1	ELECTRICIAN	DIFFERENT-
11.72	F	57	Y	2	QUALITY CONTROL INSP	I LIKE USING T
5.80	F	15	N	1		FUN
5.80	F	15	N	1		FUN
15.45	M	16	N	1		WOW
15.45	M	16	N	1		WOW

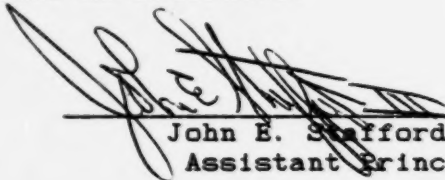
Note: Where duplicate registration data exist, the student registered for more than one course. State Education Department reporting requirements involve total numbers of students in classes.

Appendix E

Practicum Approval/Verification

This practicum took place as described.

Verifier:



John E. Stafford III
Assistant Principal

Nova-Davie Community School
3600 College Avenue, Davie, FL 33314

12-15-1987

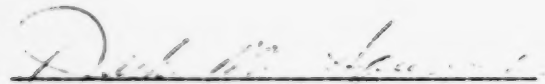
Date

This practicum report was submitted by G. Robert Wilson under the direction of the advisor listed below. It was submitted to the Ed.D. program in Computer Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova University.

Approved:

12-19-1987

Date of Final Approval



Jack Spurlock, Ph. D., Advisor